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(74) Agents: SCHORR, Frank et al.; Augustenstrasse 46,
80333 München (DE).

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(71) Applicant (for all designated States except US): CARM ZEISS SMT AG [DE/DE]; Carl-Zeiss-Strasse 22, 73447 Oberkochen (DE).

(72) Inventors; and

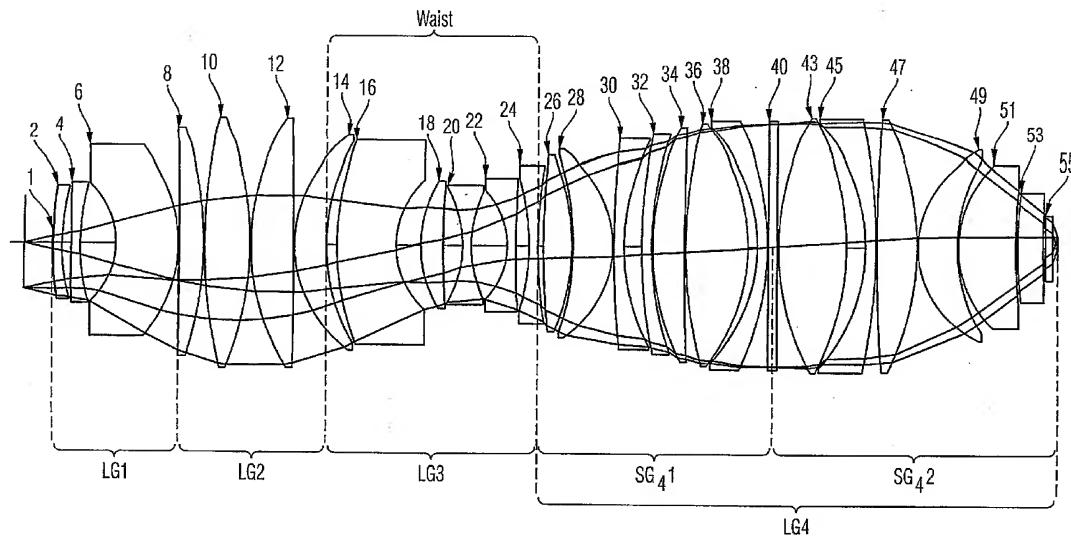
(75) Inventors/Applicants (for US only): ROSTALSKI, Hans-Jürgen [DE/DE]; Dietrich Bonhoeffer Strasse 9, 73447 Oberkochen (DE). DODOC, Aurelian [RO/DE]; Hainbuchenweg 7, 73447 Oberkochen (DE). ULRICH, Wilhelm [DE/DE]; Lederackerring 44, 73434 Aalen (DE). EPPEL, Alexander [DE/DE]; Langertstrasse 38, 73431 Aalen (DE).

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(54) Title: PROJECTION OPTICAL SYSTEM



WO 2005/054956 A2

(57) **Abstract:** A projection optical system comprises a plurality of lenses disposed along an optical axis of the projection optical system; wherein the plurality of lenses is dividable into four non-overlapping groups of lenses of positive and negative refractive powers, wherein the following relation (1) is fulfilled: (1) wherein: y is half a diameter in mm of a maximum image field imaged by the projection optical system, NA is a maximum numerical aperture on a side of the second object, ϕ_i is a refractive power in mm^{-1} of the i^{th} lens, k is a total number of lenses of the projection optical system, and wherein V_1 is greater than 0.045.



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